

REMARKS

Claims 2-12 are pending after entry of the amendments above. Claim 1 has been cancelled, and claims 2 and 3 have been amended to depend from claim 4. No new matter has been added.

Claims 1-12 were rejected under 35 USC 103(a) as being unpatentable over Aoki (U.S. Patent No. 6,151,419) in view of Li (U.S. Patent No. 6,360,009). This rejection is respectfully traversed.

Claim 4 of this application includes the feature of calculating a “difference per image sensor between a maximum value among **a plurality of readings from each image sensor** and an average value of readings from each image sensor.” With respect to claim 4, the Examiner acknowledged that Aoki does not teach calculating a difference between a maximum and an average of image sensor readings. To remedy this deficiency in Aoki, the Examiner combined Aoki with Li and concluded that Li teaches the claimed step of calculating a difference between a maximum and an average of image sensor readings. In support of this conclusion, the Examiner stated that Li teaches “the use of calculating a difference...per image window between a maximum value...among **a plurality of readings from each image window**...and an average value of readings from each image window.” (Office Action of 5/6/04 at 3, emphasis added.)

Applicants respectfully submit that not only has the Examiner produced no evidence that Li teaches the claimed feature, but the Examiner has not even argued that the claimed feature is disclosed by Li. The plain language of claim 4 does not recite performing any calculations based on a “plurality of readings from each image window.” Claim 4 clearly recites that calculations are based on “a plurality of readings from each image sensor.” As discussed in more detail below, a disclosure of a plurality of readings from an image window is substantially different from a plurality of readings from each image sensor. Applicants respectfully submit that the Examiner has not established a *prima facie* case that the claimed feature is taught by Li or Aoki.

Even if the Examiner had stated that Li discloses the claimed limitation, a plurality of readings from an image window is substantially different from a plurality of readings from each image sensor. Li describes a window as follows: “Many of the functions in the segmentation process are easily defined in terms of the 5 x 5 video matrix. This matrix is shown in FIG. 1 and can be viewed as a ‘window’ that slides across and down the input image.” (Li at col. 3, lines 13-16.) From this passage it is clear that a “window” comprises a plurality of pixels, perhaps as many as 25. All of the portions of Li cited by the Examiner teach *taking only one reading from each of a plurality of elements* in a window that defines a matrix. Li does not disclose taking a plurality of readings from the same pixel or image sensor. The Examiner has not shown that Li teaches taking a “a plurality of readings from each image sensor.”

The Examiner has also failed to present any evidence that either Aoki or Li teach calculating a difference between a maximum value and an average value as described in claim 4. Li is directed to classifying image data and discloses methods of determining whether a pixel is a peak (maximum value) or a valley (minimum value). Li teaches that, for pixels under examination, “a pixel may be considered as a video peak/valley if its gray level is the highest/lowest in the neighborhood and also, the gray level difference between the pixel and the neighborhood average is greater than a certain threshold.” (Li at col. 7, line 64 – col. 8, line 1.) Thus, Li discloses calculating the difference between any pixel to be classified and its neighborhood average values. Li does not disclose calculating the difference between a known maximum value and an average value. Li only teaches that after the difference is calculated, an evaluated pixel may be classified as a maximum value if certain criteria are met. The approach taken by Li is substantially different from the claimed invention, and the Examiner has not shown otherwise.

Because neither Aoki nor Li disclose the claimed step of calculating a difference, neither Aoki nor Li discloses “obtaining the shading correction coefficient by adding a **value**

**corresponding to the difference** of each image sensor to a correction coefficient so that the maximum value of each image sensor becomes a specified image level” as it is described in claim 4.

The rejection made by the Examiner in this Office Action is based on a combination of the Aoki and Li references. Applicants respectfully submit that the Examiner has not identified any evidence in Aoki or Li of a motivation for persons of ordinary skill in the art to have used the image reading apparatus of Aoki with the pixel classification system of Li or to arrive at the claimed invention thereby. The Examiner concludes at page 4 of the Office Action that it would have been obvious at the time the invention was made to modify Aoki’s teaching with Li’s difference formula “because Li et al.’s difference formula provides a correct classification of highlight or high reflectivity area during reading of a window (Li et al., col. 8, lines 4, 7-9).”

The portion of Li cited by the Examiner discloses that “[i]f the threshold for peak/valley detection is set too high, then some halftone dots in the highlight or shadow area may be missed...To reduce misclassification, the threshold for peak/valley detection may be tied to the neighborhood average gray value.” As the cited portion demonstrates, Li is directed to identifying specific pixels as a peak or valley pixel. As discussed above, Li performs a difference operation between a test pixel and a local average to determine if the test pixel can be classified as a peak or valley. Li does not disclose the claimed methods for calculating a difference and therefore its difference formula cannot provide a “correct classification” of anything. While Applicants agree that Li discloses classification of highlights, pixel classification is not described in either the present application or Aoki. Applicants respectfully submit that the disclosure of Li is irrelevant to the claimed invention and that the Examiner’s reasoning comes nowhere close to the analysis and supporting evidence required by *In re Lee* (277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002)) and approved in *In re Thrift*, 298 F.3d 1357, 1364-65, 63 USPQ2d 2002 (Fed. Cir. 2002). For the reasons given above, the rejection of claim 4 should be withdrawn.

Claim 5 is similar to claim 4 and includes the feature of “calculating difference between an average value of maximum values among a **plurality of readings from each image sensor** and an average value of readings from each image sensor.” With respect to claim 5, the Examiner stated that Aoki teaches “calculating a difference...and the neighborhood average...between an average value of maximum values...among a **plurality of readings...from each image window** and an average value...of readings from each image window.” (Office Action of 5/6/04 at 6, emphasis added.) Applicants respectfully submit that the Examiner has not established a *prima facie* case that the claimed feature is taught by the prior art because the Examiner has not even alleged that either reference teaches this claimed feature.

Li does not teach an “average value of maximum values.” All of the portions of the reference cited by the Examiner teach *taking only one reading* from each of a plurality of elements in a window that defines a matrix. Applicants respectfully submit that Li does not teach taking “a plurality of readings from each image sensor” as described in claim 5. Furthermore, the portions of the reference cited by the Examiner disclose only the averaging of pixels that have been identified as neighbors of pixels that are under test for identification as a peak. The most relevant portion of Li cited by the Examiner teaches that “[a]n implementation of this approach has been tested with the video average calculated as the average of the eight immediate neighbors of the pixel under detection for peak/valley.” (Li at col. 8, lines 22-25.) Applicants submit that while the cited portion of Li discloses the calculation of averages, it does not teach the calculation of an “average value of maximum values” because the values being averaged have not been identified as maximum values. As the cited passage above indicates, Li teaches the use of averaging only to determine if a pixel under test is a maximum, *i.e.* peak, value. Thus, the approach taken by Li is substantially different from the claimed invention and the Examiner has not shown otherwise.

Because neither Aoki nor Li discloses the claimed method of calculating a difference, neither Aoki nor Li discloses “obtaining the shading correction coefficient by modifying a

correction coefficient for correcting the image data so that the maximum value of each image sensor becomes a specified image level in correspondence to **the difference of each image sensor**” because, as discussed above, the difference of each image sensor is not taught by either reference.

As Applicants discussed above in connection with claim 4, the Examiner has not identified any evidence in Aoki or Li of a motivation for persons of ordinary skill in the art to have combined the references. For the reasons given above, the rejection of claim 5 should be withdrawn.

The Examiner rejected independent claims 8-11 using the arguments made in connection with claims 4 and 5. Applicants respectfully submit that claims 8-11 are patentable for at least the same reasons given with respect to claims 4 and 5 above.

Claim 12 includes the feature of “gain adjustment means for changing the amplification factor of the amplification means according to the difference data.” In the Office Action, the Examiner stated that components of the Shading Correcting Unit (13) of Aoki are the claimed gain adjustment means and that amplifier (11) disclosed at fig. 3, num. 11 of Aoki is the claimed amplification means. Applicants respectfully submit that even if the Shading Correcting Unit (13) of Aoki discloses a gain adjustment means, the Shading Correcting Unit (13) does not have the feature of changing the amplification factor of the amplification means (11). According to Aoki, “[t]he shading correcting unit 13 accomplished according to an embodiment of the present invention may correct digitalized read data based on the following formula by using black reference data which has been previously stored, white reference data as to the respective photoelectric converting elements of the line sensor 5, and a white reference correction coefficient.” (Aoki at col. 5, lines 36-42.) Aoki further discloses that “[t]he output signals derived from the respective photoelectric converting elements of the line sensor 5 are amplified by the amplifier 11, and thereafter the amplified output signals are A/D-converted by the A/D converting unit 12 into digital light amount signal D<sub>n</sub> which are sequentially outputted to the shading correcting circuit 13.” (Aoki at col. 8, lines 7-10.)

The portions of Aoki recited above reveal that the gain adjustment means does not have the feature of “changing the amplification factor of the amplification means.” Applicants respectfully submit that the Examiner has not identified any evidence in the specification or figures of Aoki that shows that the element the Examiner identified as corresponding to the claimed gain adjustment means (Shading Correcting Unit (13)) has any effect whatsoever on the element the Examiner identified as corresponding to the amplification means (amplifier (11)). The rejection of claim 12 should, therefore, be withdrawn.

In light of the above, early allowance of claims 2-12 is solicited.

In the event the Patent and Trademark Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 204552020800.

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